



AgriTech Solutions: Innovating VET for Sustainable Agriculture

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EXPERT CONSULTATIONS

Precision farming

Experts/organizations: ZZ "STUBA", TD DZP KLECHOVCE DOOEL, ADUT GVN, AG FUTURA Technologies, „KAV KOMERC AND AGRO KAV KOMERC", COMPANY „STOJCHEVI and WINERY ARBESKA", INDIVIDUAL FARMER MARJAN TANCHEV, LISA – KOM KAVADARCI, INDIVIDUAL FARMER STEFAN STOJCHEV, AGRIJA DOOEL, Individual farmers groups and individuals, IZ Branko Atanasov, Livestock farm

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Location: Kumanovo, Sveti Nikole, Skopje, Strumica, Kavadarci, Valandovo, Veles

Short description

Stojan Mitrov, is the owner of the company Lisa-Kom from Kavadarci, which works with drones and sells drones. This small family company also provides expert - advisory services for the use of drones for the needs of agricultural producers and their production. This company is not specialized exclusively in precision agriculture, but also has a service for Disinfection, Disinsection and Deratization.

Precision agriculture is a modern approach that uses digital technologies to precisely monitor and manage crop production. It is applied through:

- **GPS and GIS systems** – for accurate mapping of fields and planning of work activities.
- **Soil and plant sensors** – to measure moisture, nutrients and plant condition
the crops.
- **Drones and satellite imagery** – for monitoring growth, detecting stress and
planning interventions.
- **Variable Rate Application (VRA)** – precise dosing of water, fertilizers and
protective equipment only where necessary.
- **Autonomous machines and robotics** – for precise execution of sowing, spraying and harvesting.
- **Digital platforms** – for data analysis and bringing better agricultural
decisions.

This approach **increases productivity, reduces costs**, while also enabling **more secure and sustainable production**.

Every year, **greenhouse producers** start implementing some innovations in terms of the application of technology in agriculture. They use sensors to measure



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temperature, soil moisture and pH. They use an automatic irrigation and fertilization system. By applying this technology, they were able

to precisely determine when to fertilize and irrigate, using optimal conditions for growth and development. However, education in the application of new technologies needs to be increased, which would also increase the use of technologies in agriculture.

AG Futura Technologies (AGFT) is a private consulting firm specializing in agriculture and food systems, operating in the national, regional and European markets. It provides comprehensive support tailored to businesses of all sizes, integrating cutting-edge digital technologies, including precision agriculture, artificial intelligence (AI) and remote sensing to optimize farm management and food production.

Precision farming is a modern approach to agricultural production that uses technology and data to manage land, plants, and resources in a more efficient and sustainable way. Instead of treating the entire field equally, precision farming allows for zone-based management, meaning that each piece of land gets exactly what it needs – no more, no less.

Basic characteristics of precision agriculture

Technologies used are GPS and GIS (geographic information systems) – for mapping and analyzing soil and yields. Soil and plant sensors – measure moisture, pH, temperature, nutrient needs. Drones and satellite imagery – monitor plant health and detect problems (stress, diseases, deficiencies). Automated mechanization – precise fertilization, sowing, spraying and harvesting. Sophisticated software and applications – for analyzing and making decisions based on collected data.

Goals of precision agriculture

Increasing yield and quality of products, rational use of water, fertilizers and pesticides, reducing production costs, protecting the environment, improving long-term land productivity.

Application in vegetable production (tomatoes and peppers)

Precise irrigation and fertigation based on real needs, monitoring of microclimate conditions in greenhouses, timely detection of diseases and pests with drones, optimized use of space and resources, harvest forecasting and planning

of production.

Conclusion

Precision farming represents the future of agricultural production – technology at the service of efficiency, profitability and sustainability. By applying it, farmers can better manage their resources, reduce losses and increase yields, all with less impact on the environment.



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The introduction of increasing technology in agriculture and its application, the acquisition of skills for the application of new technology in agriculture, all with the aim of better quality growth and development of plants, should be increased through the education of the population as well as new generations of farmers. By doing so, farmers facilitate the search for additional labor, which unfortunately is increasingly lacking. With the education itself for the use of technologies in agriculture, they will gain knowledge and application of all technologies, as well as this technology, with the help of which they know how to accurately determine when to fertilize and irrigate, by applying optimal conditions for growth and development.

As a result of the change in technologies, new changes are also coming to agriculture for the application of new technologies. By incorporating them into the curricula, the number of educated generations will increase who will be able to more easily and precisely use the increasing technology that is being applied in agriculture, which is of great benefit to everyone.



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